United States Patent

[11] **3,554,070**

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[21] Appl. No. **776,831**
[22] Filed **Nov. 18, 1968**
[45] Patented **Jan. 12, 1971**

[54] **PERFORATING STRIP FOR PRINTING PRESSES**
2 Claims, 6 Drawing Figs.

[52] **U.S. Cl.** **83/678,**
83/332, 83/347; 93/58.2, 101/226
[51] **Int. Cl.** **B26d 1/22**
[50] **Field of Search** 101/226;
83/332, 347, 676, 678, 660; 76/107; 93/58.2, 58.6

[56] **References Cited**
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ABSTRACT: This invention relates to an improved perforating strip for printing presses. More particularly, the invention relates to a device for perforating paper as the paper passes over the impression cylinder of an offset or lithographic press, the device comprising an elongated thin metal strip having a base portion and having upstanding teeth along one edge of the base portion, the teeth being spaced apart from each other and the base portion having notches therein between the teeth so that the base portion is of reduced width at the notches, the notches providing relief of pressure of paper pressing against the teeth and base portion and permitting each of the teeth to flex individually.

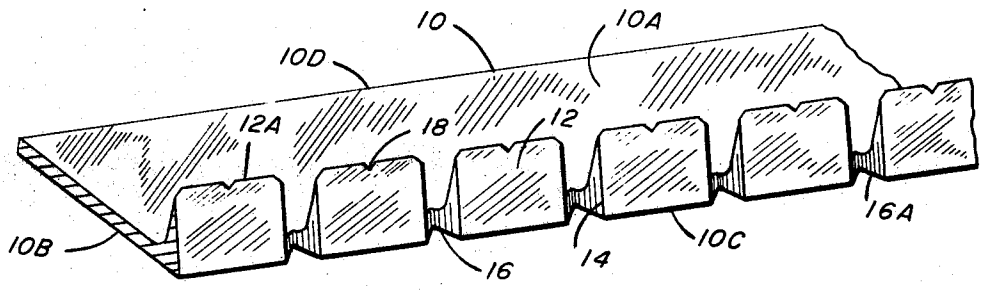


FIG. 1

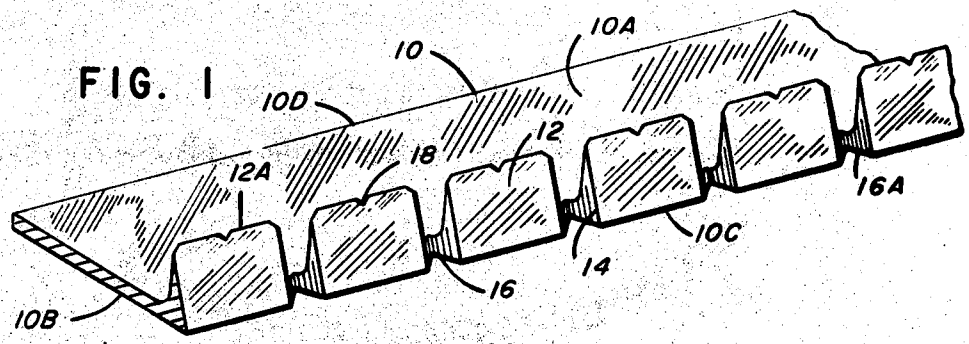


FIG. 2

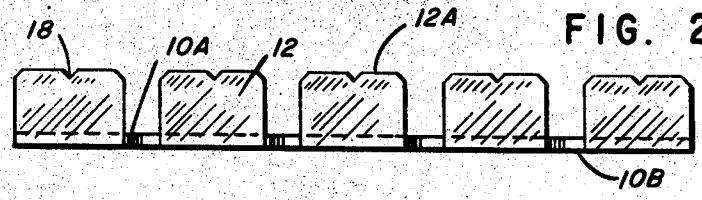


FIG. 3

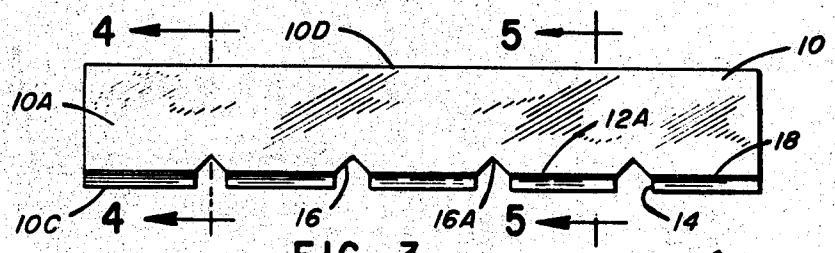


FIG. 6

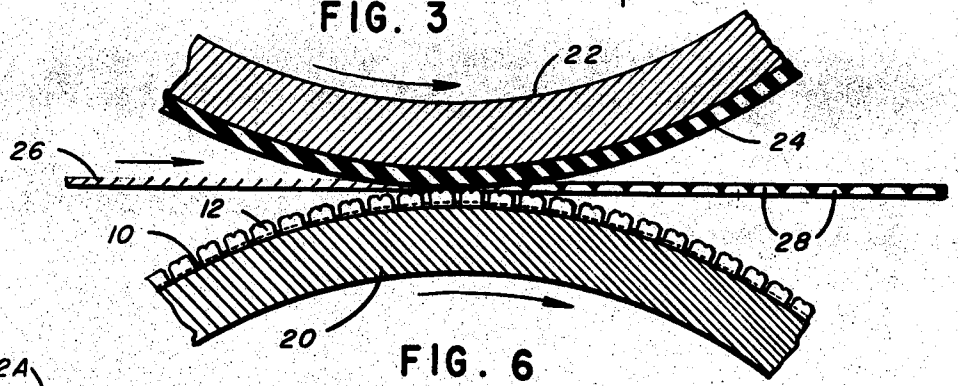


FIG. 4

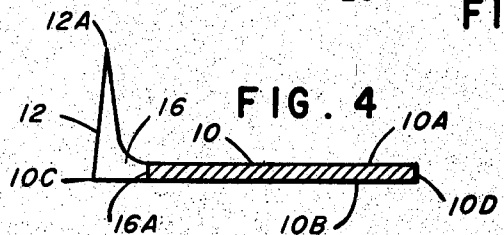
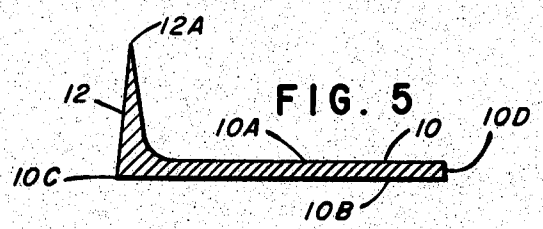


FIG. 5



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PERFORATING STRIP FOR PRINTING PRESSES

CROSS-REFERENCE

This disclosure is not related to any pending Unites States or foreign patent application.

BACKGROUND AND SUMMARY OF THE INVENTION

Printers are frequently required to produce printed material requiring perforations so that users of the printed material may easily separate one part from another. Examples of such include the printing of checks, advertising material including coupons, and so forth. In the past it has been necessary to perform the printing and perforation by two separate steps utilizing separate machines. To shorten the work involved in printing material including perforations, I devised a perforating strip which can be attached directly to the impression cylinder of an offset or lithographic press, the perforating strip being described in U.S. Pat. No. 2,842,202, issued Jul. 8, 1958.

The perforating strip described in the above-mentioned patent has functioned completely satisfactorily and the use of such perforating strip by printers has become widespread. While the perforating strip disclosed in U.S. Pat. No. 2,842,202 has functioned satisfactorily, I have found that the invention can be improved upon, the improvement of such device being the subject matter of this disclosure.

In the perforating strip as disclosed in U.S. Pat. No. 2,842,202, the teeth which perform the perforations bottom against a metal base strip. As paper passes over the strip the teeth project into the paper causing the paper to separate and this separation causes some accumulation of paper thickness between the teeth. This additional paper thickness causes increased pressure of the base portion of the strip. In addition, in the arrangement wherein the teeth extend uprightly along one edge of the base portion of the perforating strip the pressure of paper against the teeth tends to bend the entire edge portion and puts the entire edge portion under continuous stress which sometimes causes a crystallization of the material along the edge resulting in a failure of the strip in advance of its normal wear life.

The invention of this disclosure provides means of improving the performance of perforating strips of the type used to attach to impression cylinders of printing presses by overcoming the disadvantages of the prior disclosed types of perforating strips.

It is therefore an object of this invention to provide an improved perforating strip.

More particularly, an object of this invention is to provide an improved perforating strip for use on impression cylinders of offset or lithographic presses for perforating paper passing through such presses.

A still more particular object of this invention is to provide an improved configuration of a perforating strip for attaching to the impression cylinder of an offset or lithographic press for perforating paper passing through the press including means of reducing the pressure applied against the edge of the strip and providing means wherein the teeth of the perforating strip can flex individually.

These and more specific objects of the invention will be understood by reference to the following description and claims.

DESCRIPTION OF THE VIEWS

FIG. 1 is an isometric view of one embodiment of the improved perforating strip of this invention.

FIG. 2 is a side view showing the upstanding teeth along one edge of the base portion of the perforating strip of this invention.

FIG. 3 is a top view of the improved perforating strip of this invention.

FIG. 4 is a cross-sectional view taken along the line 4–4 of FIG. 3 and showing the configuration of the cross section as taken between upstanding teeth.

FIG. 5 is a cross-sectional view as taken along the line 5–5 of FIG. 3 and showing the cross-sectional view of the perforating strip as taken through an upstanding tooth.

FIG. 6 is a fragmentary cross-sectional view of portions of an offset or lithographic press showing means whereby paper is perforated by the perforating strip of this invention.

DETAILED DESCRIPTION

Referring now to the drawings and first to FIGS. 1, 2 and 3, the improved perforating strip of this invention is shown. The device is a unitary elongated thin metal strip having a base portion 10 and upstanding teeth 12. The base portion 10 is of rectangular cross-sectional configuration having a flat upper surface 10A and flat lower surface 10B. The lower surface 10B is provided with means for affixing the strip to the impression cylinder of an offset or lithographic press, the most expeditious means of affixing the strip to a press being by use of adhesive. In preferred arrangements an adhesive is applied to the lower flat surface 10B covered by a removable cover treated so as not to adhere to the adhesive. When the operator is ready to use the perforating strip the paper covering is pulled off and the strip stuck directly to the impression cylinder.

The base portion 10 has parallel edges 10C and 10D. Edge 10C is provided with upstanding integral teeth 12. Each of the teeth 12 has an upper sharpened edge 12A which engages and perforates the paper.

The perforating strip described up to this point is of a known arrangement such as previously disclosed in U.S. Pat. No. 2,842,202. The invention herein includes the arrangement wherein the teeth 12 have a space 14 therebetween and includes a notch 16 in the base portion 10 at each of the spaces 14. By this arrangement, as best shown in FIGS. 3, 5 and 6, the width of the base portion 10 taken between the teeth 12 at a notch 16 is less than the width as taken through a tooth 12.

The perforating strip of this invention is used as illustrated in FIG. 6, by cementing the lower surface 10B to the surface of a printing press impression cylinder 20. The press platen 22 is covered with a rubber blanket 24 into which the teeth 12 of the perforating strip slightly extend as the platen and impression cylinder are rotated against each other. Paper 26 passing between the platen 22 and impression cylinder 20 is engaged by teeth 12 forming perforations 28 in the paper. Perforation is normally accomplished by use of the perforating strip of this invention concurrently with printing of paper 26 although it may be done as a separate process if desired.

Notches 16 are preferably of V-shaped configuration as best shown in FIG. 3 with the apex 16A of the V-configuration being spaced from the plane of teeth 12. Such arrangement is not mandatory, however, as notches 16 may be V-shaped or of other configurations.

The provision of notches 16 at spaces 14 between teeth 12 performs two basic functions. First, as the teeth 12 engage and push through paper, the paper is severed, so that an extra thickness of paper tends to appear around each of the teeth 12. This extra thickness of paper applies, in the prior arrangement, to increased pressure against the base portion 10. By the provision in this invention of notches 16 in the base portion 10, the pressure against the base portion 10 of the perforating strip is reduced.

In addition, in the prior arrangement wherein the edge of the base portion having the teeth is uninterrupted, the pressure against the perforating strip teeth tends to bend the entire edge of the strip as it is pressed against the rubber blanket of the platen. By the provision of notches 16, however, each tooth 12 is permitted to flex individually. This flexure is distributed over a wider portion of the strip, the flexure being distributed over the portion from the notch apex 16A out to edge 10C. This provision for increased independent flexure of each tooth 12 spread over a wider area of base portion 10 reduces the opportunity for crystallization of the strip and insures longer useful life.

FIGS. 1, 2 and 3 show an arrangement wherein each tooth 12 is several times in length the space 14 between adjacent teeth. This is arbitrary. In some arrangements the length of

teeth **12** and the length of space **14** may be more nearly equal. In addition, tooth **12** is shown with an intermediate notch **18**. This is optional as the teeth **12** may be of a variety of geometrical configurations depending upon several factors, including the size of perforations to be formed in the paper, the type of paper, speed of operation of the press, and the type of press to which the device is applied.

While the invention has been described with a certain degree of particularity it is manifest that many changes may be made in the details of construction and the arrangement of components without departing from the spirit and scope of this disclosure. It is understood that the invention is not limited to the abstract herein, nor the embodiment which has been illustrated for purposes of exemplifying the invention, but the invention is to be limited only by the scope of the attached claim or claims, including the full range of equivalency to which each element thereof is entitled.

I claim:

1. An improved perforating device for affixing to an impression cylinder of an offset or lithographic press for perforating paper passing through the press comprising an elongated thin metal strip having a base portion of rectangular cross-sectional configuration having flat upper and lower surfaces and paralleled edges, the lower flat surface being adaptable to be affixed to a press impression cylinder such as by adhesive, and having integral upstanding teeth along one edge thereof extending substantially perpendicular to said base portion, said teeth being spaced apart from each other, and said base portion having notches therein between said teeth whereby said base portion is of reduced width at said notches, said notches permitting each of said teeth to flex individually as paper is forced thereagainst.

2. An improved perforating device according to claim 1 wherein said notches in said base portion between said teeth are of V-shaped configuration, the apex of the V-configuration being spaced from the plane of the teeth.